Downloaded from orbit.dtu.dk on: May 05, 2023

DTU Library

Opinions on biogas in organic farming

Heiske, Stefan; Østergård, Hanne

Published in:
ICROFS news

Publication date:
2011

Document Version
Publisher's PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):
Heiske, S., & Østergård, H. (2011). Opinions on biogas in organic farming. *ICROFS news*, (1), 8-9. http://orgprints.org/18983

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Opinions on biogas in organic farming mixtures

By Stefan Heiske and Hanne Østergård, Technical University of Denmark
Risø DTU National Laboratory for Sustainable Energy

Archived at http://orgprints.org/18983

The application of biogas technologies in organic farming involves many considerations: Benefits like improved fertilizer supply and fossil fuel savings are opposed to concerns about economical risks and incompliance with organic principles.

A questionnaire developed by Risø DTU gives an idea about some Danish stakeholders' perceptions of benefits and drawbacks.

In public debates about future energy supply, biogas is among the most widely considered technologies.

The Danish government's "Grøn vækst" programme (Green Growth) aims at substantially increasing biogas capacities in Denmark, mainly in the agricultural sector. Organic agriculture is highly dependent on external energy supply, at present mainly derived from fossil fuels. Biogas may be a chance to extend the sustainable approach being part of the organic principles to the energy use in organic farming.

However, sustainable biogas production requires careful integration into local agricultural frameworks. Thus, its application raises many questions about e.g. economical possibilities and risks, fertilizer supply and application, compliance with organic principles, process reliability etc.

The questionnaire

A questionnaire about biogas in organic farming carried out by Risø DTU in connection with the research project BioConcens and INBIOM (see "Read more" Box) gives insight in how stakeholders perceive biogas technologies in organic farming. Understanding the stakeholders' point of view can point out critical issues related to biogas applications and thereby give impulses for targeted political actions.

Strengths	Weaknesses
Climate benefits - Reduction of GHG emissions	**Compromising organic principles -** Harms image of organic farming
New source of income - Heat and power as new products to trade with	**Difficulties in plant operation -** Uncertainty about stable and efficient operation
Energy self-supply - Secured supply for own demand	**Shortage of biomass resources -** Uncertainty about availability, suitability and price of biomasses
Fertilizer supply - Contribution to phase out conventional manure	**Financial risk -** High investment costs, unknown repayment time
Opportunities	**Threats**
Subsidies - ...for installation costs, energy trade, for certain biomasses	**Unstable markeds -** Uncertainty about prices of energy and biomass
Available biomass resources - Use of municipal organic waste contributes to nutrient recirculation	**Limiting rules and laws -** e.g. heat supply law, restrictive planning regulations
Infrastructure - Integration in the energy supply system, reliable heat and power sales	**Sceptical position to biogas -** Plant location, transport, odors
Improvement of biogas technology- Research and development increases efficiency, stability and income	**Political unsteadiness -** Uncertain conditions for support and requirements in the future

Figure 1: Selected SWOT- factors with short description

The biogas seminar

In December 2010, a seminar about biogas-based energy self suffiency in organic farming was arranged by BioConcens and INBIOM. The participants from agriculture, advisory services, research and authorities identified factors, which are considered to be relevant in the discussion on the application of biogas. The factors were grouped into four categories, namely **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats, following a so-called SWOT analysis. For the questionnaire, four factors from each SWOT-category were selected (see Figure 1), and respondents were asked to compare those pair wise.

Results from the questionnaire

The questionnaire was sent out to more than 200 people from the biogas and agricultural sector in Denmark as well as linked to the IN-

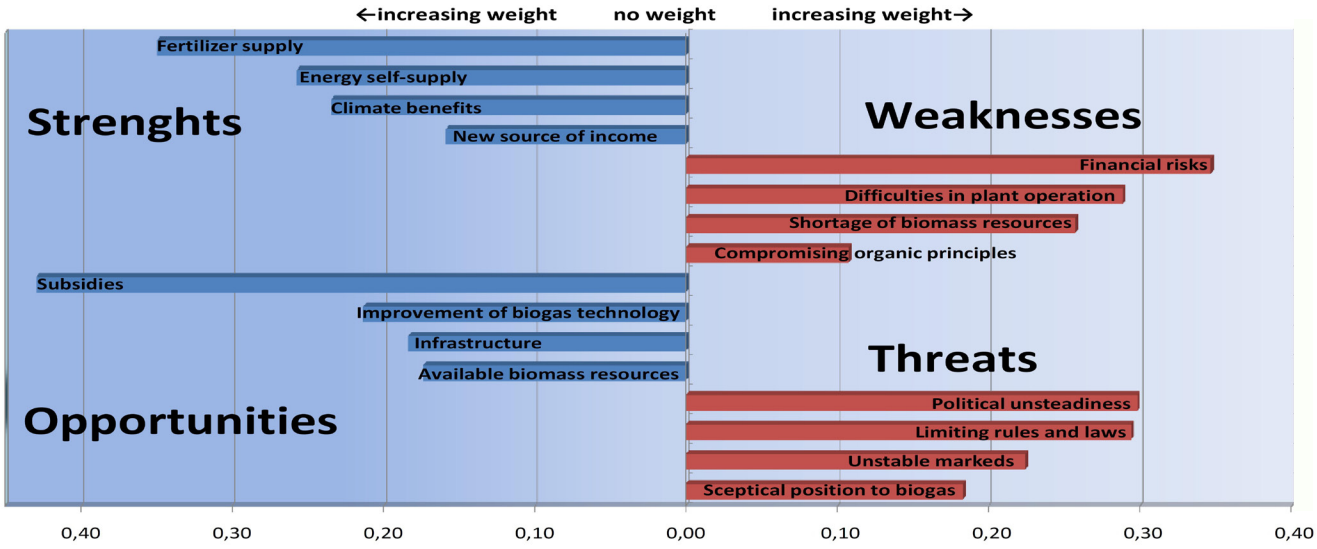

Figure 2: Weighting of the selected SWOT-factors (all respondents)

BIOM homepage. The answers were quantitatively evaluated using SWOT-AHP (Analytical Hierarchy Process). The results are expressed in scores which identify the average weight of a factor to all other factors of a category. For detailed information about the method see the reference box.

A great majority supports biogas in organic agriculture

75 stakeholders responded to the questionnaire, of which 55% dealed with organic farming. Of the respondents, 88% stated that they would support politics promoting the application of biogas technology in organic farming (5% no, 7% don't know). The respondents were divided in stakeholder groups, namely *research (51%), advisory services (24%), industry (16%) and others (9%).* The average weightings of all respondents are shown as calculated scores in Figure 2.

Focus on fertilizer benefits

The highest rated strength of having biogas in organic farming was identified as *fertilizer supply* by all stakeholder groups, while least weight was given to the strength-factor *new source of income*. The undesirable necessity of many organic farms to import conventional manure as fertilizer is presumably a reason for

this priority, as degassed biomass can contribute to a self-supply of fertilizer.

Emphasis on the importance of subsidies

Among opportunities, all stakeholder groups gave highest importance to *subsidies*. All other opportunity-factors were rated comparatively low. For weaknesses, the picture was less clear: Researchers and advisory services identified *financial risk* as the most relevant weakness of the technology. In contrary, industry and "other" stakeholders found the greatest weakness to be *shortage of biomass resources* and *difficulties in plant operation*, respectively. In the threats-category, *political unsteadiness* and *limiting rules and laws* had the highest priority. The high weighting of *subsidies, financial risks* and *political unsteadiness* underlines the importance of reliable framework conditions for the implementation of biogas technologies. This, along with the stakeholders' generally supportive view on biogas technologies, suggests that with economic incentives and clear political targets biogas may be widely applied in organic agriculture.

Incompliance with organic principles?

Concerns that biogas could *compromise organic principles* have not been emphasized by many respondents, while this factor was considered important by some participants in the December seminar. The priorities set by the respondents may indicate that for these people sufficient regulations have been established to maintain the organic principles and the difference between biogas applications in organic and conventional agriculture.

More than energy production

Unlike a wind turbine, a biogas fermenter is more than an energy production plant: Besides producing energy, the fermentation of biomass has many impacts on the farming system with respect to e.g. crop management and use of the involved biomasses. The respondents' low rating of *energy self-supply* together with the emphasis on *fertilizer supply* benefits reflects this fact. Therefore, political initiatives need to consider both energy related aspects such as regulation for end use of heat and power, as well as land use aspects like legislation on the application of degassed biomass and the introduction of external organic wastes.

Read more

Find more information about BIOCONCENS project and INBIOM on the webpages: www.icrofs.org/Pages/Research/darcofIII_bioconcens.html and www.inbiom.dk/en/knowledge/knowledge.htm

Reference

P. Dwivedi, J. Alavalapati, 2009: Stakeholders' perceptions on forest biomass-based bioenergy development in the southern US. Energy policy 37, 1999-2007.